

IN THE CLAIMS:

1 1-19. (Cancelled)

1 20. (Previously Presented) An information searching device comprising:

2 a buffer for storing data to be searched,

3 a selector configured and arranged to select at least a portion of the buffer's con-
4 tents; and

5 a storage facility coupled to the selector so as to receive the selected portion of the
6 buffer's contents, the storage facility having a plurality of associative memories sequen-
7 tially configured and arranged such that the output from an upstream associative memory
8 is provided to at least one downstream associative memory, the associative memory be-
9 ing loaded with information against which data in the buffer is to be matched, wherein
10 the information is translated into a Boolean function prior to being loaded
11 into the associative memories, and
12 each associative memory stores a segment of the Boolean function.

1 21. (Previously Presented) The information searching device of claim 20 further
2 comprising preparer logic configured to extract one or more fields of a network mes-
3 sage, and to place the extracted fields into the buffer.

1 22. (Previously Presented) The information searching device of claim 21
2 wherein the preparer logic prepends the extract fields to the network message, and
3 places both the network message and the prepended extracted fields into the buffer.

1 23. (Previously Presented) The information searching device of claim 22 wherein
2 the information stored in the associative memories corresponds to one or more Access
3 Control Lists (ACLs) specifying actions to be applied to network messages.

1 24. (Previously Presented) The information searching device of claim 23
2 wherein the network message is an Internet Protocol Version 6 (IPv6) message.

1 25. (Previously Presented) The information searching device of claim 20
2 wherein
3 the information is first translated into a Binary Decision Diagram (BDD), and
4 each segment of the BDD is translated into a Sum of Products (SOP) format prior
5 to being loaded into its respective associative memory.

1 26. (Previously Presented) The information searching device of claim 20 further
2 comprising a plurality of secondary memories each having a plurality of storage loca-
3 tions, wherein
4 a selected one of the secondary memories is associated with each associative
5 memory,

6 each associative memory has a plurality of entries,
7 each associative memory entry identifies a matching storage location of its asso-
8 ciated secondary memory, and
9 a downstream associative memory receives as an input a selected portion of the
10 buffer and the matching storage location of the secondary memory associated with the
11 upstream secondary memory.

1 27. (Previously Presented) The information searching device of claim 26 wherein
2 the matching storage location of the secondary memory associated with the last of the
3 associative memories indicates an action for the data stored in the buffer.

1 28. (Previously Presented) The information searching device of claim 20 is
2 formed from:

- 3 (a) one or more Application Specific Integrated Circuits (ASICs);
4 (b) one or more Field Programmable Gate Arrays (FPGAs); or
5 (c) at least one ASIC and at least one FPGA.

1 29. (Previously Presented) An information searching device comprising:
2 means for selecting a portion of data to be searched; and
3 means for searching the selected data portion for a predefined value, wherein
4 the searching means includes a plurality of associative memories organized in a
5 stream such that the output from an upstream associative memory is provided to at least

6 one downstream associative memory, the associative memories being loaded with infor-
7 mation against which data in the buffer is to be searched, wherein
8 the information is translated into a Boolean function prior to being loaded
9 into the associative memories, and
10 each associative memory stores a segment of the Boolean function.

1 30. (Previously Presented) The information searching device of claim 29 wherein
2 the data to be searched is a network message having a plurality of fields that are searched
3 for a predefined value.

1 31. (Previously Presented) The information searching device of claim 30 further
2 comprising means for identifying an action to be applied to the network message being
3 searched in response to matching a predefined value in a given field.

1 32. (Previously Presented) The information searching device of claim 31
2 wherein the network message is an Internet Protocol Version 6 (IPv6) message.

1 33. (Previously Presented) The information searching device of claim 31
2 wherein the action is one of forward, drop, encrypt and log.

1 34. (Previously Presented) The information searching device of claim 29 wherein
2 each downstream associative memory compares its segment of information against the
3 output from its respective upstream associative memory and the selected portion of data.

1 35. (Previously Presented) A method of searching one or more fields of a net-
2 work message for a predefined value, the method comprising the steps of:
3 loading a plurality of associative memories, which are organized in a stream, with
4 information against which the fields of the network message are searched;
5 storing at least one or more fields of the network message in a buffer;
6 selectively applying at least part of a network message field from the buffer to an
7 upstream associative memory to generate an output; and
8 selectively applying at least part of a network message field from the buffer and
9 the output of the upstream associative memory to a downstream associative memory;
10 generating an action to be applied to the network message from the last associa-
11 tive memory.

1 36. (Previously Presented) The method of claim 35 further comprising the steps
2 of:
3 prior to loading the information into the plurality of associative memories, trans-
4 lating the information a Boolean function; and
5 storing a segment of the Boolean function in each associative memory.

1 37. (Previously Presented) The method of claim 36 further comprising the step of
2 providing a secondary memory for each of the associative memories, the secondary
3 memories configured to store the outputs.

1 38. (Previously Presented) The method of claim 37 wherein the information
2 loaded into the associative memories corresponds to one or more Access Control Lists
3 (ACLs).

1 39. (Previously Presented) The method of claim 38 wherein each associative
2 memory is a ternary content addressable memory (TCAM) supporting don't care
3 values